ABSTRACT

A novel product composed of a ceramic phase particle dispersoid in metal, including uniformly distributed, finely sized carbide phase particles formed in situ in a molten metal and a novel method for producing such a ceramic phase particle dispersoid in metal are disclosed. A salt-based liquid state reaction involving a liquid metal / alloy containing a liquid Ti, B, Si, Sc, Hf, Nb, Ta, Zr, Mo, Al (when the molten metal matrix is not aluminum), or V and a halide salt containing carbon particles forms a uniform distribution of finely sized ceramic phase particles formed and dispersed in-situ in the metal matrix. The ceramic dispersoid in metal product of the present invention includes at least about 50 volume percent of a matrix metal of aluminum; and up to about 50 volume percent of a uniform distribution of finely sized ceramic phase particles formed and dispersed in-situ in the aluminum metal matrix, wherein the finely sized ceramic phase particles have an average particle diameter of less than about 2.5 microns, and wherein the uniform distribution consists of a substantially cluster-free distribution of no more than two particles attached to one another at a magnification of 500X.